

THREE NEW INTERTIDAL SPECIES OF LIMNICHIDAE (COLEOPTERA) FROM NEW ZEALAND

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Abstract. *Hyphalus kuscheli*, *H. prolixus* and *H. ultimus* spp. n. are described. The new species occur at and below high water mark on barnacle-encrusted rocks on beaches on the north-east coast of the North Island of New Zealand.

The genus *Hyphalus* has so far been represented by two species, *H. insularis* Britton (1971) (Fig. 2) from the north-east coasts of Australia, and *H. wisei* Britton (1973) (Figs. 3, 6) known only from Leigh on the north-east coast of the North Island of New Zealand. While collecting *H. wisei* near Leigh, Dr G. Kuschel recently made the surprising discovery that another closely allied species of *Hyphalus* replaces *H. wisei* a few metres higher on the shore. The new species, *H. kuscheli*, is described below. Later, I received from Mr K. A. J. Wise 34 specimens of the genus from localities in the Bay of Islands (c. 35° 15'S, 174° 13'E). Seven of these proved to belong to *H. kuscheli* and the remainder to two additional new species which are described here as *H. prolixus* sp. n. and *H. ultimus* sp. n.

All three species were first collected, in the Bay of Islands, by Mrs J. M. Gurr in March 1975, additional specimens of *H. prolixus* and *H. ultimus* were taken on Moturoa I off Karikari Peninsula in May 1976 by Mr P. MacDonald, and further specimens of *H. prolixus* on Karikari Pen. in September 1976 by G. Kuschel.

Abbreviations used in the text

AM Auckland Museum Collection
ANIC Australian National Insect Collection, Canberra
ED Entomology Division Collection, Department of Scientific and Industrial Research, Auckland.

KEY TO THE SPECIES OF *Hyphalus*

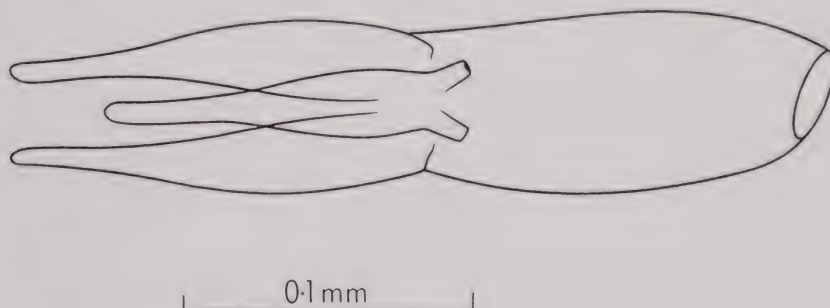
- | | | |
|------|--|-------------------|
| 1 | Posterior angles of the pronotum acute, subrectangular; pronotum less transverse, ratio length: width c. 1.60:1..... | 2 |
| | Posterior angles of the pronotum obtuse; pronotum more transverse, ratio width: length c. 1.7:1..... | 4 |
| 2(1) | Setae on the apical declivity of the elytra (view in profile) not of two different lengths; elytra less elongate (ratio length:width c. 1.30:1) (Fig. 2) (E Australia) | insularis Britton |
| | Setae on the apical declivity of the elytra of two distinct lengths; elytra more elongate (ratio length:width c. 1.45:1) (NE New Zealand) | 3 |

- 3(2) Surface of pronotum and elytra bearing obvious tubercles (Fig. 8); the longer setae on the elytra about 2 x length of shorter setae..... **kuscheli** sp. n.
 Surface of pronotum and elytra without obvious tubercles; the longer setae on the elytra conspicuous, about 4 x length of the shorter setae (Fig. 4) ... **ultimus** sp. n.
- 4(1) Antennal segments 4 and 5 longer than broad (ratio length:width c. 1.3:1); setae on the base of the pronotum just before the scutellum directed obliquely backwards and outwards (Fig. 5); eye with 30 facets **prolixus** sp. n.
 Antennal segments 4 and 5 not elongate (ratio length:width c. 1.0:1); setae on the base of the pronotum just before the scutellum directed obliquely backwards and inwards; eye with 26-29 facets (Figs. 3, 6) **wisei** Britton

Hyphalus kuscheli sp. n.

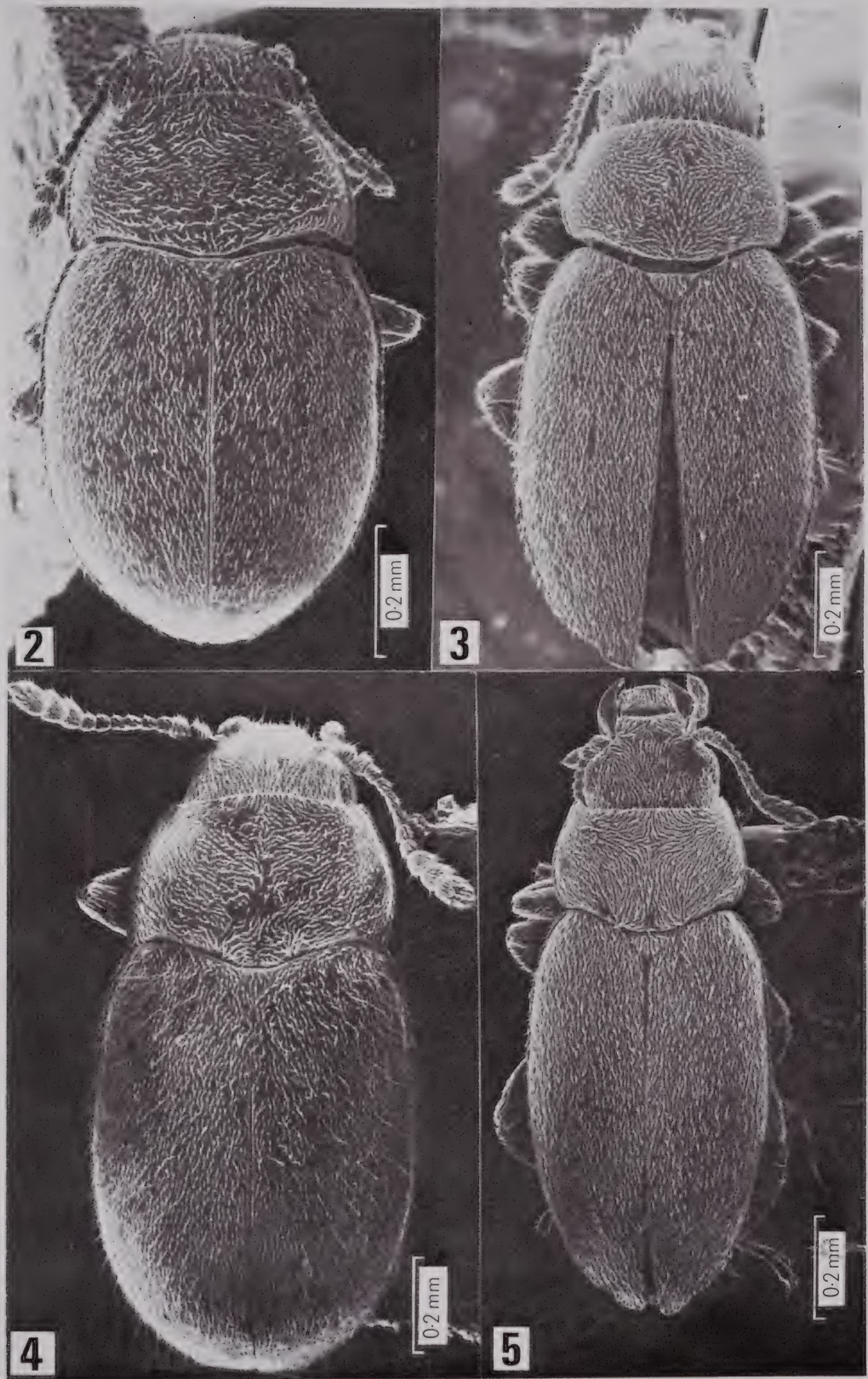
(Figs. 1, 7, 8)

Length 1.2-1.6 mm, maximum width (of elytra) 0.65-0.68 mm. Colour: whole body surface black, densely clothed with short, whitish or colourless setae which give the insect a greyish appearance. Legs very dark brown; palpi and antennae black. Setae of two kinds, more numerous, recumbent, shorter setae and longer, more erect but less numerous setae. Dorsal surface of head, pronotum and elytra with minute, sparse, but fairly uniformly distributed tubercles (see pronotum in Fig. 8). Pronotum ratio greatest width:mid length 1.6:1. Elytra ratio greatest width:mid length c. 1.45:1. Separation of the hind coxae as in *H. wisei* (ratio width between coxae:width of one coxa 1.0:1). Antennal segments 4-6 elongate (ratio length:width c. 1.5:1). Setae on pronotum close to the scutellum directed backwards and outwards. Eye composed of 31 facets (Fig. 7). Aedeagus with median lobe distinctly shorter than the parameres (Fig. 1).

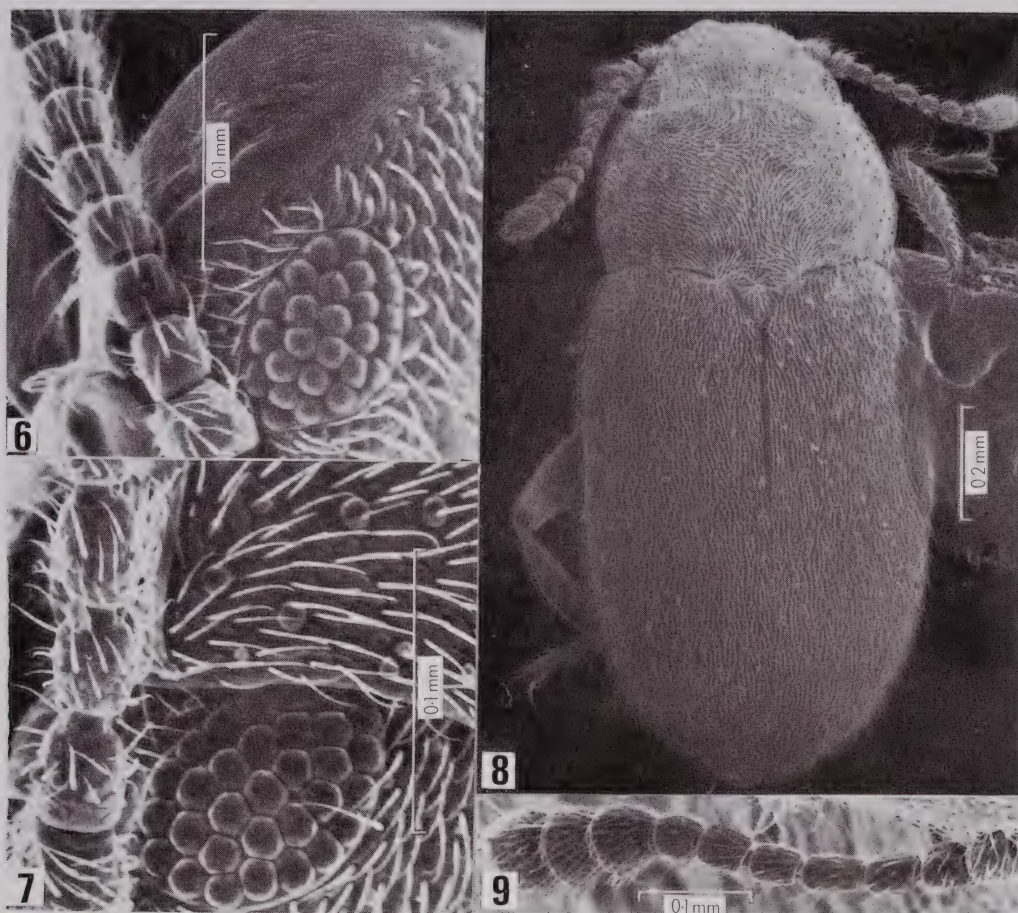
Fig. 1. *Hyphalus kuscheli*. Aedeagus.

Types. Holotype ♂. NEW ZEALAND: North Island, near Leigh, (36°16'S, 174°48'E), Marine Research Station of the Zoology Department, University of Auckland, on the shore in the upper littoral zone, characterized by the barnacle *Chamaesipho brunnea*, 3. ii. 1976, G. Kuschel, ED. Paratypes, locality as for holotype, 23. i. 1976, 3. ii. 1976, 20. viii. 1976, G. Kuschel, 9, ED, AM, ANIC; Bay of Islands, Napia Bay (35°10'S, 174°03'E), 6. iii. 1975, J. M. Gurr, in rock crevice, at high water mark (below recent spring h.w.m.), 7, AM, ED, ANIC.

Dr Kuschel observes that *Hyphalus kuscheli* and *H. wisei* occur at different levels on the same beach. *H. kuscheli* is found just above mean high tide level in the splash zone which is kept moist by waves only about high tide. This is confirmed by the fact that the specimens from the Bay of Islands were also taken at the high water mark. This is the upper littoral zone characterized by the crust formed by the barnacle *Chamaesipho brunnea*. *H. wisei* occurs lower on the beach, in the mid-littoral zone characterized



Figs. 2-5. *Hyphalus* spp. 2. *H. insularis*. 3. *H. wisei*. 4. *H. ultimus*. 5. *H. prolixus*.



Figs. 6-9. *Hyphalus* spp. 6. *H. wisei*. Eye and antennal segments 2-8. 7. *H. kuscheli*. Eye and antennal segments 3-6. 8. *H. kuscheli*. Dorsal. 9. *H. ultimus*. Antenna.

by the barnacle *Chamaesipho columna*, a level which is normally submerged for about two hours at each tide. This is also the habitat of the intertidal pseudoscorpion *Maorchthonius mortenseni* Chamberlin. The beetles are associated with the barnacle crust which, with the death of some individuals, becomes porous. The barnacles are on the substrate of hard sandstone and there are no boulders on the shore. The locality is sheltered, in contrast to the west coast of the North Island where Dr Kuschel has searched the intertidal zone near the mouth of Manukau Harbour for *Hyphalus* spp., without success.

Dr Kuschel has noted that the eggs of *Hyphalus kuscheli* are so large that the abdomen could not accommodate more than two. The ovipositor is also very long (c. 0.6 mm, or almost half the body length) and heavily sclerotised. The large eggs doubtless permit a shortened free larval life and the long, strong ovipositor allows the eggs to be deposited in crevices in the substrate, both adaptations to the harsh conditions of wave action and alternate wetting and drying necessarily suffered by an intertidal species.

Hyphalus prolixus sp. n.

(Fig. 5)

Length *c.* 1.4 mm. Colour black, with a uniform clothing of short, semierect, colourless setae. Antennae with segments 4 and 5 elongate (ratio length:width *c.* 1.3:1). Eye composed of 30 facets. Pronotum ratio greatest width:mid length *c.* 1.74:1, the posterior angles obtuse. Elytra elongate-ovoid, ratio greatest width:mid length 1.30-1.60:1. Setae on base of pronotum, just anterior to scutellum, directed obliquely backwards and outwards.

Types. Holotype ♂. NEW ZEALAND: North Island, Joliffe Point, (34°50'S, 173°25'E), Matai Bay, Karikari Peninsula ND, mid to upper littoral zone, 22.ix.1976, G. Kuschel, ED. Paratypes, data as for holotype, 12, ED, ANIC; Moturoa I, (34°47'S, 173°22'E), Cape Karikari, v.1976, P. MacDonald, 4, AM; Bay of Islands, Moturoa I, (35°13'S, 174°12'E), Otupoho Bay, in rock crevice below high water mark, 26.iii.1975, J. M. Gurr, 14, AM, ED, ANIC; Bay of Islands, Te Hue (35°15'S, 174°13'E), in rock crevice below high water mark, 4.iii.1975, J. M. Gurr, 1, ANIC; Bay of Islands, Urupukapuka I, (35°13'S, 174°14'E), Entico Bay in rock crevice below high water mark, 28.iii.1975, J. M. Gurr, 5, AM; Bay of Islands, Waewaetorea I, (35°12'S, 174°13'E), in rock crevice below high water mark, 1.iii.1975, J. M. Gurr, 1, AM.

H. prolixus is quite similar to *H. wisei* (Fig. 3) but can be distinguished by the larger eye, by the fact that the setae at the mid-base of the pronotum are directed obliquely outwards whereas in *H. wisei* they are directed obliquely inwards, and by the more elongate 4th and 5th antennal segments.

Hyphalus ultimus sp. n.

(Figs. 4, 9)

Length *c.* 1.3 mm, maximum width (of elytra) *c.* 0.67 mm. Colour black, densely clothed with colourless setae. Setae of two kinds as in *H. kuscheli* but with the longer setae markedly longer and more erect than in that species. Head, pronotum and elytra without tubercles. Pronotum ratio greatest width:mid length *c.* 1.6:1. Elytra ratio length:width *c.* 1.35:1. Setae on base of pronotum, just anterior to scutellum, directed obliquely backwards and outwards. Antennal segments 4, 5 and 6 elongate, ratio length:width of segment 5, *c.* 1.65:1. Eye composed of 32 facets.

Types. Holotype. NEW ZEALAND: North Island, Moturoa I, (34°47'S, 173°22'E), Cape Karikari, v.1976, P. MacDonald, ED. Paratypes, Bay of Islands, Napia Bay, (35°10'S, 174°03'E), 6.iii.1975, in rock crevice at high water mark, J. M. Gurr, 2, AM.

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Errata. In Britton (1973) p. 121, line 15, for 1.55:1 read 1.45:1 and line 22, for 1.5:1 read 1.7:1 and for 1.6:1 read 1.55:1.

REFERENCES

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